Gender integration in agriculture, food Security and climate change policy: a framework proposal

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Abstract:

Effective gender integration in policy has been proposed in many sectors and policies. CCAFS FP1 LAM has endorsed to favor mainstreaming of gender issue within climate and food security policy in agricultural sectors in Latin America. This document aims at providing a framework to analyze the current integration of gender issue and bottlenecks for further integration. Based on an extensive academic and grey literature regarding gender issue in policy, this document propose a state of the art on existing frameworks integrating gender issues in agriculture, CC and food and nutrition security, and criteria to evaluate gender integration. It finally proposed a framework to be tested in the CCAFS FP1 LAM to capture and understand the situation of gender integration within policy mix tackling CC and food nutrition security in agricultural sector.

Keywords:

Agriculture, food security and nutrition, Climate change, Gender, Sustainable Food System, Policy mix, Policy Integration

Contents

1. Introduction

Achieving gender integration in policy design, implementation and monitoring and evaluation (M&E) has been considered crucial to achieve national development goals. This report proposes a state of the art on the link between gender and climate change (CC) and food security and nutrition (FSN) policies in agricultural sectors to develop a framework able to analyses policies processes conducive to integration of issue and solution (implementation). It finally propose an analytical framework to address policy process of agriculture, CC, FSN from a gender perspective in the context of Latin America and Caribbean (LAC).

The first part presents the background of the issue, with a first sub-section exploring why it is relevant to consider gender to address agricultural challenges in relationship with CC and FSN. Then the international context regarding gender, CC and FSN is exposed and linked with national policy context with a focus on the LAC region.

This general panorama will introduce the need for a collaborative framework integrating these topics. Thus, in a second par, we present the results of a preliminary literature review conducted on the links between these topics, namely CC - FSN; gender - CC, gender - FSN and gender – CC – FSN in the LAC region and elsewhere. This review allowed to identify: i) framework and variables to assess the links and level of integration of these topics, and ii) the bottlenecks and recommendations to achieve gender sensitive policies and programmes.

The identification of frameworks and criteria through the literature review enable the design of an analytical framework that integrate gender, CC and FSN considerations. This analytical framework is presented in the third section so as its scope, conceptual background and recommendations for its operationalization. The implementation of this framework in Guatemala and Honduras constitutes the next step of the FP1 LAM CCAFS project “Shaping equitable climate change policies for resilient food systems across Central America and the Caribbean”.

2. Background

2.1. The relevance of gender in Agriculture, Climate Change, and Food Security and Nutrition

Gender and agriculture

Addressing the gender gaps in agriculture is not only relevant in terms of a human rights and equality perspective but also in terms of strategic and economic development.

First, to consider gender dimensions in agriculture is relevant, as this sector constitutes the most important source of employment for women in rural areas in most of the developing country regions (FAO, 2011). They also represent 43% of the agricultural labor force in developing countries on average, and about 20% in Latin America (FAO, 2011). Nevertheless, those numbers need to be considered carefully as the economic contributions of women in rural areas are often systematically underestimated because of lack of available data, gender norms - women tasks are seen as duty and not work - and definition adopted for data collection (Gutierrez-Montes et al., 2018; IICA, 2018). It should also be noticed that not only men and women have differentiated preferences and constraints but also that ‘rural women’ should not be treated as an homogeneous category, since different types of women (depending on their age,

race, socio-economic status, ethnicity, etc) will have different preferences, challenges and play different roles in agriculture, fishery, livestock, etc. (Gutierrez-Montes et al., 2018; IICA, 2018).

Even though women contribute largely to the agricultural sector in developing countries, they have less access than men to productive resources such as assets, inputs, services, land, education, financial services, technologies and opportunities (Coello et al. 2015; FAO, 2011; Gutierrez-Montes et al., 2018; IICA, 2018). Women are also more likely than men to engage in seasonal employment and receive lower wages (FAO, 2011). Besides, female-headed households may be more vulnerable to economic shocks and to fall into poverty, especially when the woman's income is the only one in the household or when it comes from non-labor sources (like transfer) (IICA, 2018). Women have also been found to be 4 to 25% less productive than male farmers, depending on the country and the crop (Women UN, 2015). This situation is all the more serious since research has shown that female farmers are just as efficient as male farmers but they produce less because of this lack of access to resources and opportunities gap (FAO, 2011). The consequences of not addressing gender gap is also reducing per hectare yields and leads to over-cultivation, soil erosion and land degradation (Women UN, 2015). Thus, this gender gap is having a cost not only on the women themselves but also on the agricultural sector and the economy in general (FAO, 2011). Together, these inequalities are known as the gender gap in agriculture (FAO, 2011). It has been calculated that closing the gender gap could increase agricultural output in the developing world by 2.5% to 4%, on average (FAO, 2011). For example in Malawi, Tanzania and Uganda closing the gender gap in agriculture would amount to $100, $105, and $67 million respectively (Women UN, 2015). No such estimation has been calculated for LAC countries.

Indeed, as Kristjanson et al., (2017) sum up: “Agricultural development efforts that do not address persistent gender gaps miss opportunities for greater impact”.

Gender and Food and Nutrition Security challenges in agriculture

Addressing the gender gap in agriculture could also be a way to reduce food insecurity and malnutrition (FAO, 2011; IICA, 2018). Indeed, the nexus women – food security and nutrition is relevant in two aspects; women as victim of food insecurity and malnutrition and women as key to foster food availability (production), access and use. Thus, Njuki et al. (2016) highlighted that countries with the most severe hunger problems are also the ones with the highest levels of gender inequality.

Njuki et al. (2016) recall that the 1996 World Food Summit Plan of Action defined that there is food security when “when all people, at all times, have access to sufficient, safe, nutritious food to maintain a healthy and active life” (World Food Summit 1996). The concept is based on three pillars; (1) *food availability* (sufficient quantities of food available on a consistent basis); (2) *food access* (sufficient resources to obtain appropriate foods for a nutritious diet) and (3) *food use* (appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation) (Njuki et al., 2016).

Women play a key role on the three pillars of food and nutrition security. Regarding food availability level, closing the gender gap in agriculture could improve agricultural yields between 20 and 30% and reduce hunger between 12 and 17% in the LAC region (IICA 2018). At the food access and food use level, women play a key role in food security and nutrition. For instance, when women control additional income, they spend more of it than men do on food, health, clothing and education for their children (FAO, 2011). In Central America, women-headed households whose male partner have migrated have the highest levels of food security and food diversity relative to other groups suggesting that money controlled by women is allocated at greater rates toward family nutrition (Coello et al. 2015).

In the context of LAC, IICA (2018) pointed out that the region is also facing the “triple burden" of malnutrition including the simultaneous presence of malnutrition, micronutrient deficiency and obesity. Since women are overrepresented among the rural poor in the LAC region (2/3 of LAC population still lives in poverty), empowering women in agriculture would be key not only for the sector performance and for gender equality but also for poverty reduction and food security (IDB, 2014; IICA, 2018).

Gender and Climate Change issue in agriculture

Men and women agricultural producers face multiple climate stressors within a complex social, political, and environmental contexts and also adapt differently to these challenges (Bryan et al., 2017a; Resurreccion, 2011). At the global level, it is expected that climate change (CC) will exacerbate these differences and aggravate social discrimination, worsening the situation of people, in general, and of women in particular (Adger, 2014; CDKN, 2017; Gutierrez-Montes et al., 2018). CC could in this way undermine the progress made in terms of gender equality (CDKN, 2017). Decision makers still lack of context-specific information on how to address CC challenges without sacrificing other development goals such as gender equality (Bryan et al., 2017b). In the context of climate change, gender presents both opportunities and challenges to increase agricultural productivity and improve livelihoods (Kristjanson et al., 2017). In this sense, there exist a clear potential to accelerate gains and overcome barriers to intervention implementation considering multiple challenges such as CC and gender in the agricultural sector through gender-sensitive programmes (Bryan et al., 2016; Bryan et al., 2017a).

Gender in Agriculture and food and nutrition challenges in the climate context

Within this context, it becomes clear that considering the nexus between gender, agriculture, food security and nutrition and climate change is relevant. Women as contributing to agricultural production, transformation, and playing a key role in the food availability and use should be taken into account for one side. Besides, as a vulnerable group, CC context could exacerbate this situation and difficult the roles they are already playing. Finally, closing gender gap could not only reduce gender inequality but also address current and future productivity and food security and nutrition challenges in a context of CC.

2.2. International context

At international scale, is observed two processes ongoing and linked; first economic globalization has increased inequality between men and women, and second powerful supranational actors have risen and devoted to human and environmental rights issues (True and Mintrom, 2001).

In this context, several agreements have been discussed and reached to foster gender equality in development policies, to address CC and food security and nutrition issues (Table 1). This international context needs to be taken into account as its growing influence on processes, institutions, policy narratives at national level have been pointed out (Kennett and Lendvai, 2014).

Table 1: International agenda related to gender, climate change, and Food security and nutrition

Years	Events
1966	International Covenant on Economic, Social and Cultural Rights (The right to adequate food)
1979	Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (Women's specific role for rural development)
1992	Convention on Biological Diversity (CBD) (Women as strategic actor for the conservation and sustainable use of biological diversity)
1992	United Nations Conference on Environment and Development (Rio)/ Agenda 21 (participation of women in sustainable development and public life)
1992	references to gender made by the United Nations Framework Convention on Climate Change (UNFCCC)
1992	The Global Plan of Action on Nutrition of the International Conference on Nutrition (Special attention to the gender gap in nutrition)
1992	the Millennium Development Goals (MDGs) (Highlight the close interlinkages between gender equality and women's empowerment)
1995	Beijing Platform for Action (governments were required to promote an active and visible policy for its implementation) United Nations economic and social council (ECOSOC) established guiding principles for gender mainstreaming
2000	Millennium Declaration and the Millennium Development Goals
2002	World Summit for Sustainable Development (Johannesburg) (Gender focus in all policies)
2006	World Summit on Food Security and The World Food Summit Plan of Action (Highlights full and equal participation of men and women for achieving sustainable food security)
2007	United Nations Declaration on the Rights of Indigenous People (DECRIPS)
2012	The First Version of the Global Strategic Framework for Food Security and Nutrition GSF (Gender issues in food security and nutrition)
2012	Rio +20 (The importance of empowering rural women as critical agents)
2013	FAO's Voices of the Hungry (Food insecurity indicator allowing disparities in food access based on e.g. gender)
2015	Agenda 2030 for Sustainable Development Goals (Goal 5: "Achieve gender equality and empower all women and girls")
2015	Paris Agreement (Gender equality and women's concerns are embedded in the agreement)

In pink: Gender agenda, In green: CC agenda, in yellow: transversal agenda; in blue: Food Security and Nutrition agenda

The inclusion of gender considerations within other agendas such the CC one, has been characterized as a struggle (Resurreccion, 2011). For instance, Kyoto Protocol did not include gender considerations (expect for the need to include gender experts in the National Adaptation Programmes of Action (NAPAs)) (Resurreccion, 2011). This can partly be explained by the fact that CC international actors such as the Intergovernmental Panel on Climate Change (IPCC), the scientific bedrock of the UNFCCC, the UN Environment Programme (UNEP) and the World Meteorological Organization (WMO) do not discuss gender dimensions of CC but much more technical aspects and solutions to CC (Resurreccion, 2011).

The Beijing platform for action (1995) is considered as a turning point as it has been widely and at an unprecedented speed adopted by countries to formulate national policies for gender mainstreaming (Acosta et al., 2018; Kennett and Lendvai, 2014; True and Mintrom, 2001). Moreover, it allowed institutional strengthening by creating state bodies such as ministries or secretariats focused on the vindication of women's sexual and reproductive rights (CDKN, 2017). In the same way, international organizations (multilateral and bilateral donor organization) have adopted gender mainstreaming strategies for their intervention frameworks (FAO, DANIDA, European Union for instance) (Kennett and Lendvai, 2014). Thus, international organizations network have been the main actor promoting gender mainstreaming through concept such as good governance or best practices which are traduced in actions

such as gender analysis, gender data collection, M&E, gender budgeting, trainings, guidelines etc. (Kennett and Lendvai, 2014; True and Mintrom, 2001). Gender mainstreaming can be implemented at the field level in project and development programmes, at the institutional level within development institutions and organizations (donors and implementers), and at the government level (DANIDA, 2006). The achievement of the goals formulated in these agreement would allow to move from a culture of privilege to a culture of rights and equality (IICA, 2018). In the case of Guatemala and Honduras, both countries have adopted Beijing agreements respectively in 1990 and 1994 but at a distinct level. Indeed, True and Mintrom (2001) distinguish high and low-level national "machineries" established by countries. According to these authors, the high level institutions refers to stand alone government ministries offices within the head of state's department or quasi-autonomous state agencies such as national commissions. On the contrary, low level state machineries are defined as specific divisions for gender equality within ministries (labor, social welfare), commissions or institutes in charge of gender mainstreaming. According to True and Mintrom (2001), analysis Guatemala has adopted a low level mechanism whereas Honduras has adopted a higher one. However, despite a strong international context on gender, and the fact that gender mainstream has been broadly adopted in national policies, gender inequalities have not been systematically addressed on the ground (Acosta et al., 2018).

To understand the gap between governmental adoption of international agreement and the impact on gender equality strategies in the field, it is useful to mobilize concepts related to international norm translation (Acosta et al., 2018; Kennett and Lendvai, 2014). Indeed, policy design is "deeply embedded in power dynamics" (Kennett and Lendvai, 2014). In Acosta et al (2018) is shared a conceptual framework used to understand discursive translations of gender mainstreaming norms for agricultural and CC policies in Uganda. In the study, norm translation is described as a negotiation and adaptation process where meaning is shaped and reconstructed to fit into specific discursive and normative context (Acosta et al., 2018). Translation process from international norms around gender at national but also at sub-national level, is one factor explaining explain barriers to effective gender mainstreaming/ implementation gaps (Acosta et al., 2018). Indeed, gender norms formulated and defined at international level can compete with other norms at local level (Acosta et al., 2018) or be over-simplified through multiple translation processes (Kennett and Lendvai, 2014). Besides, the adoption of a gender discourse or the formulation of policy instrument at local level may not directly translate into change in practices (Acosta et al., 2018). Norms are understood as a share understanding on principles or procedures among actors (Acosta et al., 2018). Thus this process is key to identify ambiguity in translation, periodization in interpretations, incoherence that can explain implementation barriers or gaps (Acosta et al., 2018).

Thus an active international context is important to push countries to formulate policies that address gender gaps and inequalities but maybe not enough to effectively observe a significant impact at the local level.

2.3. Policy context

From the international level, governmental and non-governmental actors are pushed to mainstream gender in their policies and strategies as key step towards achieving greater gender equality (Ampaire et al., 2017b). Besides this, gender mainstreaming is also promoted as a strategic way to achieve economic and social development goals such as increasing women's productivity (Ampaire et al., 2017b; FAO, 2011; Coello, 2015; Women UN, 2015). However, gender mainstreaming implies adjusting existing policies or designing new ones, which will requires additional resources for the government (Women UN, 2015). This aspect can constitute a barrier for its full implementation.

Indeed, gender-mainstreaming efforts at national level have not fully translated into advances in gender equality (Acosta et al., 2019; IICA, 2018). Indeed, the persistence of gender gap in agriculture suggests that constraints are still inadequately tackled in agricultural policy strategies and programs (Women UN, 2015). Despite international commitments, there remains a strong resistance to advance gender equity and sometimes even setbacks in the institutionalization of the gender mainstreaming approach (CDKN, 2017). Gender norms are often resistant to change because they benefit the gender that holds the social and economic power and/or because they are unconsciously integrated (Njuki et al., 2016). Increasing the agency of women has been suggested as a way to overcome or challenge unequal gender norms by questioning norms and exploring opportunities (Njuki et al., 2016).

Some arguments have been identified to explain the gender implementation gap in policy. For instance, there is a lack of gender consideration in CC policies because of their technological approach (new technology and tools for CC adaptation) that ignore gender inequality for the adoption and implementation of those technologies (CDKN, 2017; Gumucio and Rueda, 2015; Njuki et al., 2016). For instance, policy solutions that prioritize market-based solutions can disadvantage women due to their lack of access to credit and capital (Gumucio and Rueda, 2015).

However, it is recognized that the public sector could play a key role in reducing gender gap through laws, policies, and projects (IDB, 2014; IICA, 2018; FAO, 2011) by moving from a "gender blind" to "gender aware" policy design (Gumucio and Rueda, 2015). Within these "gender aware" policies, Njuki et al. (2016) make reference to Muralidharan's program typology (Muralidharan et al., 2014) related to their level of gender integration, which can be "gender-accommodating" or "gender-transformative". The gender-accommodating approach refers to programmes that take into account and work around inequitable gender norms, roles and relationships without directly challenging established norms and gender power relations. Whereas the gender-transformative approach (GTA) goes beyond improving women's lack of access to resources and services to enabling communities "to understand and challenge the social norms that create inequalities between men and women" (Njuki et al., 2016).

Policy design involves a complex process where negotiations between actors are continuously happening in relation with their own needs, preferences and priorities leading sometimes to negative effects on the policy design outcomes (Bryan et al., 2017b). These potential tensions and disagreements between policy makers are observed not only at national level but also at local levels (Acosta et al., 2019). It is thus key to understand policy narratives around gender issues and the limited gender mainstreaming results to identify resistances, rival interest (Acosta et al., 2019).

2.4. Latin America and Caribbean context

The agricultural sector provides 16% of employment in the Latin America and the Caribbean (LAC) region (IICA, 2015). In rural areas there are around 58 million women which 17 million are economically active. Of those, only 4.5 million are considered agricultural producers (IICA, 2018). The agricultural sector is affected by the temporary migration of men to United States, which in turn accelerates the feminization of agriculture in the region (Coello et al. 2015; IDB, 2014; IICA, 2018). This situation has implications for agricultural sector as women needs to compensate men absence by playing a larger role in agricultural production (decision making and production) (Coello et al. 2015). Climate Change is posing serious threats to the region as well, with risk of exhibiting large spatial variability traduced by reduced water availability but also flooding, landslides (due to extreme precipitation) expected (IPCC, 2014). These changes could

affect agriculture productivity and threatening food security of the poorest populations for one side and exacerbate future health risks for another side (IPCC, 2014).

As a response to the challenges faced by CC, the Central America region is promoting CSA as a holistic way to improve productivity, address CC challenges and improve food security and nutrition (CEPAL et al., 2018). Recently, the CAC (Central American agricultural council) in the SICA (Central American Integration System) context launched a CSA strategy for 2018-2030: 'Estrategia agricultura sostenible adaptada al clima para la región del SICA (2018-2030)' (CAC, 2017). This strategy is articulated with the 2030 agenda for Sustainable Development goals (CEPAL et al., 2018).

Even though regional policies and strategies may take into account gender considerations, the level of gender integration and implementation in national CC-agriculture policies will ultimately depend on the country and policy actors (IICA, 2015). For example, the lack of pressure that policy and development actors face to implement gender sensitive policies has been reported to often lead to limited implementation on the ground (IICA, 2015). In this way, it becomes clear that gender integration in policy does not necessarily translate to the implementation of these on the ground and to foster change in the pre-existing gender inequalities (IICA, 2015). For instance, IICA (2015) reported that 20% of LAC countries made progress in gender integration in policies related to risk management, but only 8 countries (Bolivia, Costa Rica, Honduras, Mexico, Nicaragua, Panama, Paraguay y Peru) incorporated gender considerations as a transversal dimension in their normative framework for risk reduction. A study on gender integration in the LAC region also showed that institution representatives consider that they give more importance to gender consideration than their own institutions and mainly during the design and planning phase (IICA, 2015).

Thus, although the region has made considerable progress towards the inclusion of gender mainstreaming in policies, mandates, and governmental bodies, low level of implementation is still observed (Gumucio and Rueda, 2015). Based on IICA (2015) study, it is interesting to compare countries with contrasted situation in term of gender integration in policies such as Guatemala and Honduras. An approach focusing on bottleneck is also relevant in order to understand barriers for gender mainstreaming.

3. Literature review- conceptualization, findings and methods

This section present a non-exhaustive literature review regarding relationships between gender – CC – nutritional and food security in agricultural sector. We focused on documents addressing one of the following linkages: CC- food security/nutrition; gender-CC; gender-food security/nutrition; and gender-CC-food security/nutrition in agriculture. Research conducted in LAC region were privileged although it was not an exclusion criterion. Indeed, critical references have been found on sub-Saharan countries.

The guiding objectives for this literature review was the identification of rational and justifications mobilized to integrate at least two of these three topics (gender, CC, food security/nutrition), existing frameworks (conceptualization) that link these topics or issues, specific findings, the current criteria and methods used to address and/or assess the integration of gender, considering two types of analysis: document based analysis, and discourse based analysis.

Besides, this review allow to identify bottlenecks for gender sensitive policies and programmes on CC and food security in the agriculture sector. Those have been grouped and summarized in a sub-section so as recommendations to overcome these bottlenecks.

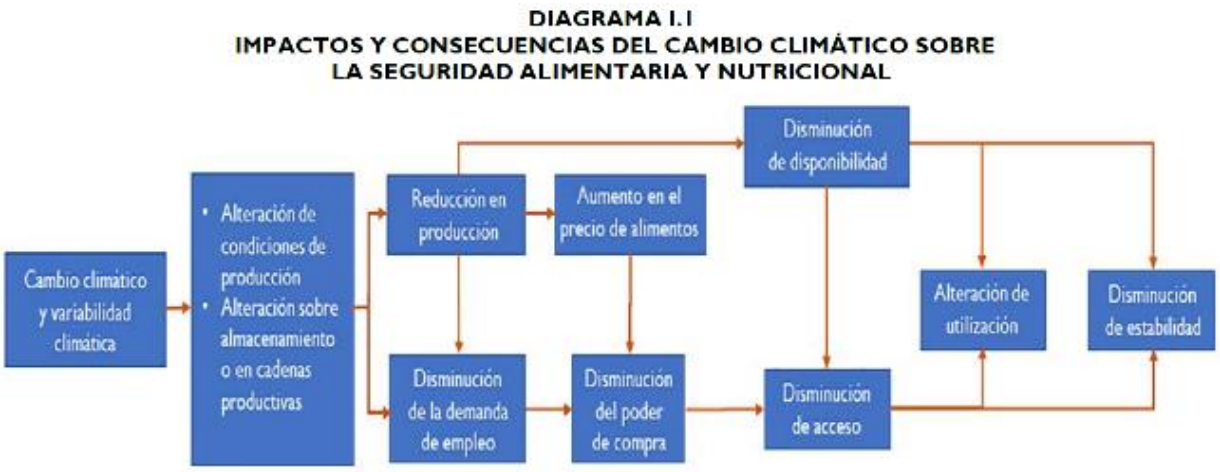
1. Climate change - Food Security and nutrition

CC affects food security and nutrition (Bryan et al., 2017a; CEPAL, et al., 2018; Cramer et al., 2017; Dinesh et al., 2018). In that context, the concept of nutrition-sensitive or nutrition-smart agriculture defined as "the design and adoption of cropping and farming systems which can provide agricultural remedies to the prevailing nutritional maladies" (hidden hunger, malnutrition) has been promoted (Beuchelt and Badstue, 2013). This concept constitutes a shift from a focus on specific crop to a focus on a farming system (including the household) (Beuchelt and Badstue, 2013).

Moreover, in the context of a changing climate, examining the food security and nutrition status of a region should follow all the steps in the value change, including production, distribution, access and consumption of sufficient, innocuous and good quality food (CEPAL, et al., 2018). By uniting these concepts of CC with food security and nutrition, it is thus relevant to talk about a "Food and nutrition system" which purpose is to achieve the availability and affordability of food (quantity), the diversity of food consumption (quality), nutrition and health of the population and environmental sustainability (CEPAL, et al., 2018). Indeed, Food and nutrition systems contribute to CC through environmental degradation and loss of biodiversity mainly due to the industrialization of production methods (use of industrial fertilizers, increase use of arable land at the expense of forests) and should take CC into account to achieve its purpose (availability, quantity, quality etc.) (CEPAL, et al., 2018; Cramer et al., 2017; Dinesh et al., 2018).

In the following box are presented examples of conceptualized link between FSN and CC. The first figure is showing how climate variability and change affect food security and nutrition dimensions (CEPAL et al., 2018). For instance, climate variability and change have an effect on production conditions. The alteration of production conditions leads to reduction in production which impact food price. The second figure is also showing how CC is impacting the food security and nutrition dimensions (FAO, 2017 in CEPAL et al., 2018). For instance, CC can exacerbate pest and diseases which impact food availability dimension. The third example is showing how CGIAR/CCAFS is conceptualizing the effect of CC on food system (CEPAL et al., 2018). In this framework, CC is affecting food system activities and products but also nutritional status. These framework are showing how CC is impacting food security and nutrition dimension but not how to assess the level of integration at policy level.

Examples of conceptualized link between Food security and nutrition and CC (CEPAL et al., 2018)

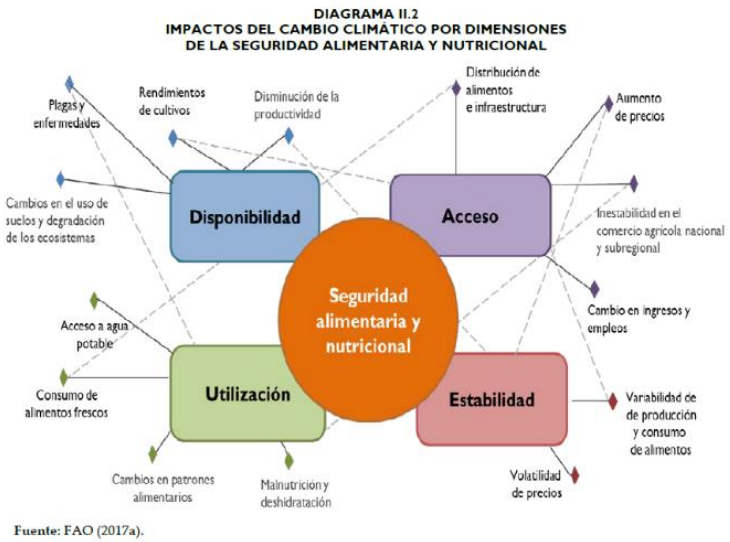


7 steps proposed by IPCC to measure CC effects on Food security and nutrition (in CEPAL, et al., 2018)

a) Define the problem
b) Choose the method
c) Test the method
d) Select the scenarios
e) Evaluate biophysical and socioeconomic impacts
f) Evaluate the autonomous settings
g) Evaluate adaptation strategies

FAO conceptualization of CC links with Food security and nutrition (in CEPAL et al., 2018)

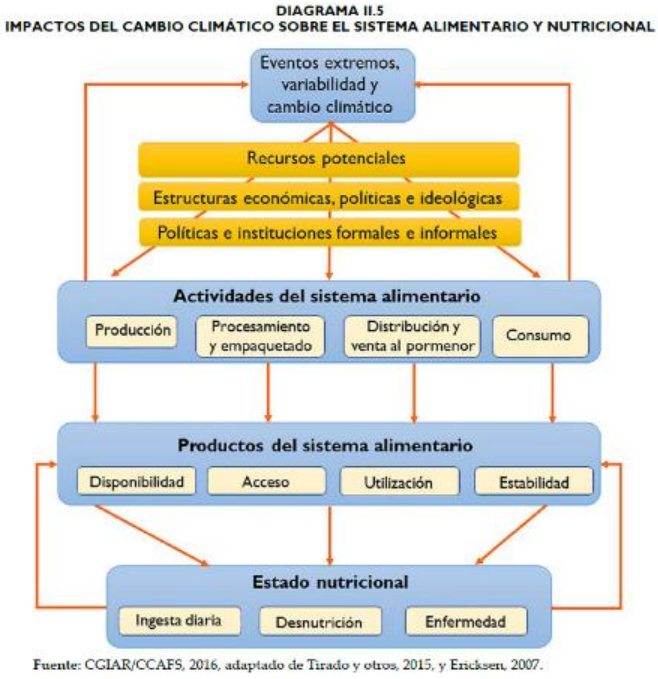
FAO identifies direct impact (continuous lines) and indirect impacts (dashed lines) of CC on Food security and nutrition. For instance, CC impact on yields affect directly food availability



Fuente: FAO (2017a).

CGIAR/CCAFS conceptualization of CC links with Food security and nutrition (in CEPAL et al., 2018)

In this Diagram, extreme events, climate variability and CC affect the food system at all stage (production, processing and packaging, distribution and retail sale and consumption). The level and consequences of impacts at each levels depends on the characteristics of each country (resource availability, political context, institutions…).



Fuente: CGIAR/CCAFS, 2016, adaptado de Tirado y otros, 2015, y Ericksen, 2007.

Food security and nutrition includes four components (availability, access, utilization/consumption and stability) all impacted by CC (Cramer et al., 2017).

The availability of food is directly affected by changes in agro-ecological conditions (land suitability, yield) and indirectly by affecting growth and distribution of incomes, and thus demand for agricultural produce (CEPAL et al., 2018; Schmidhuber y Tubiello, 2007). The projected world agricultural production decrease that could cause the increase of the prices of food, and thus limit the availability. In the case of LAC, change in pattern of precipitation (from bimodal to unimodal) could reduce from two to one planting season for basic grains and thus reduce farmers' incomes (CEPAL et al., 2018).

Access to food refers to "the ability of individuals, communities, and countries to purchase sufficient quantities and qualities of food" (Schmidhuber y Tubiello, 2007). In that sense, marginal groups impacted by CC could have their access to food degrade through reduced yields, reduced incomes, fluctuations in the availability and volatility of food price, for instance (CEPAL et al., 2018).

Utilization/consumption of food implies food safety, habits and consumption patterns, adequate and healthy health and nutrition education (CEPAL, et al., 2018). Utilization of food may be impacted by CC by making people more susceptible to infectious disease (through water, food, vectors such as malaria) which could cause a decline in labor productivity and increase in poverty (Bryan et al., 2017a; Schmidhuber y Tubiello, 2007).

Stability of food supplies which refers to have supply and access to food in a continuous and stable manner (linked with transitory food insecurity due to CC effects or change in prices) (CEPAL, et al., 2018). This dimension depends on the stability of the other element mentioned above and also countries storage and conservation capacity (CEPAL, et al., 2018; Schmidhuber y Tubiello, 2007).

However there is still uncertainty on how CC will affect Food security and nutrition in a precise way. It is clear that CC effects on Food security and nutrition involve biophysical factors (raise in temperature, change in precipitation patterns…) and socioeconomic factors (crop productivity, supply and demand for food and raise in input price…) (CEPAL, et al., 2018). It is key to understand how CC affect nutrition and health at individual's, communities' and nations' adaptive capacities (Bryan et al., 2017a). Policy is seen as a way to address adaptation and food security issues at smallholder farmers level (Ampaire et al., 2017). Thus, science policy engagement is seen as key to address knowledge gaps and informs actors at different level (government, NGOs…) in order to achieve high level goals (Cramer et al., 2017; Dinesh et al., 2018). Tools and methods have been identified to assess how the climate change and food and nutrition security affect one another such as food and nutrition scenarios, modeling of food system, M&E surveys or CSA villages (Cramer et al., 2017).

Findings

In Uganda, bottlenecks in CC/food security and nutrition policies implementation have been identified such as inadequate actor inclusion during the policy formulation, lack of articulation of CC actions, lack of awareness and ownership of existing policies, lack of scientific evidence on local needs and constraints in the policy formulation, limited technical capacity, insufficient funding (Ampaire et al., 2017)

Methods for document analysis

A food system/value chain approach is considered as relevant since it allows to think "the bidirectional relationship between climate change and nutrition" and to consider CC effects not only farm level but also transportation, processing, until consumption (Bryan et al., 2017a).

Criteria to assess	Type of criteria/level	sources
Constraints identified in the policy document (effects of CC on food security and nutrition)	National- sub-national	(Ampaire et al., 2017)
Consideration of CC at all Food security and nutrition level (availability, access, utilization/consumption and stability)	National level	(CEPAL et al., 2018)

Methods for actor analysis

Criteria to assess	Type of criteria/level	sources
Implementation constraints at local level	Local level	(Ampaire et al., 2017)
Perceived impact of CC on Food security and nutrition dimensions (availability, access, utilization/consumption and stability)	Local	(CEPAL et al., 2018)

The links between CC and food security and nutrition now established, it is useful to understand why gender integration is relevant for these two topics.

2. Gender-Climate Change

Taking into account gender considerations to address CC challenges have been shown to be relevant to achieve equity of CC adaptation strategies (Bryan et al., 2017a; Jost et al., 2016; Murray et al., 2016; Nelson and Huyer, 2016). Indeed, CC consequences could reinforce gender inequalities (FAO, 2010). For instance, CC effects on natural resource (availability and quality) may deteriorate women already limited access (by social norms) (FAO, 2010). Nelson and Huyer (2016) explain that, in that context, all 3 CSA pillars (productivity, adaptation and mitigation) need to be looked at with gender equality criteria such as social norms, socio-economic factors, livelihoods, people's capacity and access to knowledge, information, services and support to understand intra-households decision making that can shape women's participation in more sustainable practices and implementation of adapting/coping strategies.

Furthermore, it is important to distinguish between what have been called "external and objective vulnerability" from "internal and subjective vulnerability". The first is linked with family income instability, the labor market precariousness, unemployment, unstable or part-time contracts, lack of contracts and social benefits, geographical location of the house and precariousness in construction materials. The second one is related with the lack of access to assets that to address climate risks (schooling, access to land, water and credit, participation in decision-making, training and technology) (CDKN, 2017). There is a gender gap at the two levels of vulnerability. The internal and subjective vulnerability will not be fully addressed until women's specific roles, needs, access to and control over resources are not considered by policies (Bryan et al., 2017a; FAO, 2010; Kristjanson et al., 2017; Murray et al., 2016).

Perception of CC is also seen as a key element for the implementation of adaptation strategies, and has been shown to be distinct between men and women (women tend to perceive less CC, or to perceive it in a different way) (Bryan et al., 2017a; Twyman et al., 2014).

Huyer et al. (2015) defined gender-responsive climate policy as aiming to "ensure that women benefit from climate policy implementation as much as men. It addresses women's aspirations and priorities specifically. It is created through processes that listen to women's voices and incorporate women's contributions along with men's". Thus, CC policies should address gender specific issues such as women's lack of access to productive inputs (seeds, fertilizers, equipment, information, credit, education), discriminatory laws related to women access to land ownerships and cultural norms that limit women control on resources and foster women participation (FAO, 2011; IICA, 2015).

In parallel, research needs to produce information on men and women affectation by CC, their needs, preferences and specific constraints and opportunities to inform policy makers and thus go beyond comparison between households with and without adult men (Kristjanson et al., 2017).

Findings resulting from document analysis:

In general, in LAC region (Costa Rica, Nicaragua, Colombia, Peru, El Salvador, Honduras, Guatemala), CC policies tend to integrate less gender considerations than food security and nutrition policies and agricultural ones (Gumucio and Rueda, 2015).

The Central American Regional Climate Change Strategy (CAC, 2017) was the only climate change document to include gender in the action plan (but with no resources for implementation) (Gumucio and Rueda, 2015). This integration is described as the result of international organizations facilitation (Gumucio and Rueda, 2015).

In Guatemala, Gumucio and Rueda (2015) showed that 3 CC policies (the Strategic Climate Change Plan of the Ministry of Agriculture, Livestock and Food of 2012, one forest ecosystem policy, and one risk management policy) make mention of gender (Gumucio and Rueda, 2015).

Study in Mexico and Peru are showing lack of budget given to implement gender actions, the lack of citizen ownership on gender issues, the need for training and sensitization. Other result is that gender considerations in policies are not questioning social norms (CDKN, 2017).

A study lead in Uganda and Tanzania showed that gender mainstreaming at national level is not traduced at local level. Besides, gender is integrated differently depending on the sector in both countries in a disharmonized way (Ampaire et al., 2017b).

Findings from actor analysis:

In Uganda, a discourse analysis of national and sub-national policies identified five mechanisms through which the potential for transformation of gender mainstreaming strategies was diminished: silencing (ignored), gender inertia (static), shrinking gender norms, embracing discursive hybridity, minimizing budget (Acosta et al., 2018). In the same study region, another study found that policymakers often resorted to a feminist discourse, although this was not necessarily linked to improved implementation (Acosta et al., 2019).

Criteria mobilized in documents analysis related to gender – climate change issues

Criteria to assess	level of information	sources
Empowerment (quality of gender policies): authority/ autonomy "**Authority,** which is portrayed through providing decision-making power to the different groups, gives rise to the process analysis school of thought. Process analysis looks at policy formulation inquiring whether women's groups and practitioners took part at all stages of policy formulation or whether new (or amended) policies are more gender responsive than the old ones. On the other hand, the **autonomy** dimension is the basis for the content analysis school of thought. It assesses whether women and women's groups have the freedom to make their own choices, and whether the choices are integrated in the policies. The content analysis approach evaluates the content of the policies in relation to representation or the extent to which women's concerns and interests are addressed. In the context of climate change and agriculture, and within a content analysis frame"	Farmer level	(Ampaire et al., 2017b; Krizsan and Lombardo, 2013)
Criteria for effective gender integration into CC adaptation programs: Attention to gender and social inclusion (different affectation by CC); identification of context specific factors that affect adaptive capacity; participatory approach (local knowledge/capacities, address community priorities); Evidence-based implementation (programs based on gender-disaggregated research findings); Integrate climate-risk and gender perspective; address relevant barriers to adaptation for women and men (beyond technical/economic solutions); strong M&E of impacts and outcomes	National level	(Bryan et al., 2016)
Gender budget: **inputs** (money appropriated and spent), **activities** (services planned and delivered), **outputs** (planned and delivered take-up of the activities) and **impacts** (planned and actual achievements in relation to broader objectives) of the budgets	National level	(Elson, 2001 in Ampaire et al., 2017b; True and Mintrom, 2001)
Degree of gender integration in climate change, agriculture and food security policies: **grade 1** (no reference to gender issue), **grade 2** (gender mentioned in overall objectives but absent fron subsequent implementation levels), **grade 3** (gender clearly presented as one relevant entry point in relation to main objective, but absent of clear road map leading to implementation), **grade 4** (gender included in action plan, but absence of clear earmarked resources for implementation), **grade 5** (gender included in document from objective down to action plan, with clear resources identified for implementation)	National level	(Gumucio and Rueda, 2015) (Bryan et al., 2016).
Type of adaptation proposed: coping strategy, adaptation, transformative strategy	National level	(Kristjanson et al., 2017)

Literature review is made at different levels (national and sub-national) and across sectors (Acosta et al., 2018'; Ampaire et al., 2017).

Methods for actor analysis

Criteria to assess	Type of criteria/level	sources
Policy discourse/ on gender issue 3 domains discussed: the problematization of gender in CC adaptation, gender in the formulation of agriculture and CC policy and the implementation of gender considerations	National and sub-national	(Acosta et al., 2018) (Acosta et al., 2019)
Knowledge, Attitude and Practice (KAP) survey on gender integration in organization involved in CC and resilience	National and sub-national, governmental and non-governmental	(Bryan et al., 2016) (IICA, 2015)
Description of the adaptation arena	National level	(Kristjanson et al., 2017)

For Acosta et al. (2019) narrative policy analysis: "examines the processes and strategies through which certain policy understandings are constructed, consolidated, challenged or resisted in a particular policy setting by focusing on the reconstruction of policy stories and their narrative logic".

This type of analysis recognized the abstract dimension of concept such as gender and CC and are thus traduced/ understood differently depending on the context and group of actors (Acosta et al., 2019). This narratives can be captured through unstructured and semi-structured interviews, where policy actors have the space to share and elaborate on their perceptions and understandings.

In the following box is presented an example of how have been conceptualized link between gender and CC. This framework is showing how CC is impacting gender but not how to assess the level of gender integration at policy level.

Example of conceptual framework around CC and gender (Kristjanson et al., 2017)

The analytical framework presented in Kristjanson et al. (2017) include four main components; the climate signal, the vulnerability context, the adaptation arena and the well-being outcomes. In that context, adaptive capacity is represented by the vulnerability context that include user characteristics (such as gender), information and technology, biophysical characteristics of the context in which adaptation decisions are made, and the institutional context.

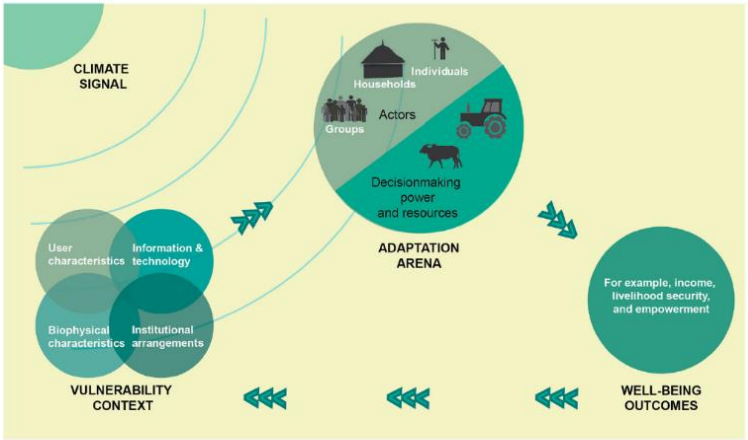


Figure 1. Framework on gender, agricultural development, and climate change. Source: Behrman et al. (2014).

The adaptation arena is where actors use resources and their decision making to respond to perceived CC or future risks. The consequences of the use of resources and the decision making process lead to a well- being outcomes, that influence the vulnerability context.

3. Gender- Food Security and nutrition

Problems of food and malnutrition insecurity cannot be solved without addressing gender inequalities (IICA, 2018; Njuki et al., 2016; UN Women, 2015). Gender inequalities exist along all the food production, "from farm to plate" which is a limit to food and nutritional security (FAO, 2010). In this context, it is relevant to adopt a "gender-aware understanding of food security" since the no consideration of gender lead to inadequate policies (Njuki et al., 2016). Closing the gender productivity gap could reduce poverty and improve nutrition since many poor work in agriculture and since it could lower food prices which could lead to enable people to purchase more and better food and increase access to food from their own production (UN Women, 2015).

In the following box is presented a tool (gender tool box) that can be used to assess the links between gender and food security and nutrition.

Example of conceptualized link between Food security and nutrition and gender
(Jost et al., 2014 in CEPAL et al., 2018)

The tool box is useful to establish a baseline and to identify where and how to integrate gender in all the project cycle, from its formulation, implementation, monitoring and evaluation:
a) Analyze gender differences in vulnerability and existing adaptation and mitigation strategies;
b) Obtain data disaggregated by sex of access to productive resources, work, use of time, and group membership;
c) Analyze the suitability of existing institutions and policies to address the impacts of CC on gender;
d) Use all the information collected, about the gender disparity, to inform the gender sensitive interventions in agriculture and CC.
However, it should be noted that the toolbox does not take into account all the food system components (CEPAL, et al., 2018).

Women's and men's participation in value chain depends on their relative access to and control over productive resources and social cultural norms (FAO, 2010). Women having less access to and control over them and constraining socio-cultural norms, can negatively affect food availability (FAO, 2010). Moreover, women access to natural resources can play an important role for nutrition through the harvesting of forest products, fish… (Bryan et al., 2017a).

Thus, women are key in all the dimensions of food security and nutrition. At the **availability** level, in LAC region, women are active in all the production stage although the lack of access to land, labour, fertilizer, credit, technology, extension and market hinders women's productivity and efficiency and thus food availability (IICA, 2018; SIDA, 2015). Tenure insecurity for women can lead to, besides, to lower investment and environmental degradation which compromise current and future production potential so as food security (Sida, 2015). Wage gap between genders limit women **access to food** mostly for women head of household (IICA, 2018). And cultural practices can limit the amount of food accessed by women and girls (Sida, 2015). **Food utilization** and consumption in LAC is showing higher female obesity (26.8%) than men (18.5%) (IICA, 2018). Empowering women can thus have effect not only on their health but also their children's. Indeed, as women are typically responsible for food preparation, they are key for the diet of their household (Sida, 2015). Finally, **food stability** will be guaranteed through gender and climate sensitive actions (IICA, 2018). For instance, women and girls tend to reduce their food consumption in crisis in favor of men, putting in risk their food security and nutrition (Sida, 2015).

It should be noted that, national laws and regulations (e.g. cooperative rules) can also limit women participation in value chains (FAO, 2010). Empowering women in value chain can also lead to better negotiation to access to health services for themselves and their children, or use earning on nutrition (Bryan et al., 2017a). This reinforces the fact policies need to support and address gender issues such as land ownership, access to input and technologies (IICA, 2018).

Method

No specific method has been found to assess the gender inclusion in food security and nutrition policies and interventions. As Bryan et al., (2017a) comment; "the agriculture-to-nutrition literature does not unpack the many factors that influence agricultural decisions and investments, such as access to information (extension and climate information services), access to technology and credit, and tenure security". Gender differences in these factors may lead to different decision making. Moreover, the same authors note that the gender and nutrition issues are rarely addressed in the resilience literature (Bryan et al., 2017a).

4. Gender-Climate Change- Food Security and nutrition

To address agricultural challenges, food security, CC and gender dimensions are key to consider. Indeed, women play important role in agricultural production (for their labor and knowledge) and dietary diversity at the household level (FAO 2011b; UNDP, 2012; UNDP, 2016). Reducing gender gap in agriculture has a great potential to increase yields and reduce food insecurity and malnutrition (FAO 2011b; UNDP, 2012). The three main challenges are (1) improving food and nutrition security of poor women, men, girls and boys, (2) reducing gender and social inequalities, (3) favoring sustainable development (Beuchelt and Badstue, 2013). Indeed, as CC produces extreme events such as drought, floods, land degradation, the risks to food security and agricultural productivity increase (IICA, 2018; Sida, 2015). Thus, there is a need to foster men and women adaptive capacity.

In the following box are presented two conceptualization of the links between gender, CC and food security and nutrition in agriculture. The first example is showing how CC is affecting gender and food security and nutrition (Bryan et al., 2017b). In the second example the figure is presenting a conceptual model for enhancing gender and social equity in nutrition and CSA (Beuchelt and Badstue, 2013). However these framework are not specific to assess gender integration in policy design and implementation.

Example of conceptualized link between climate resilience, gender and nutrition
(Bryan et al., 2017b)

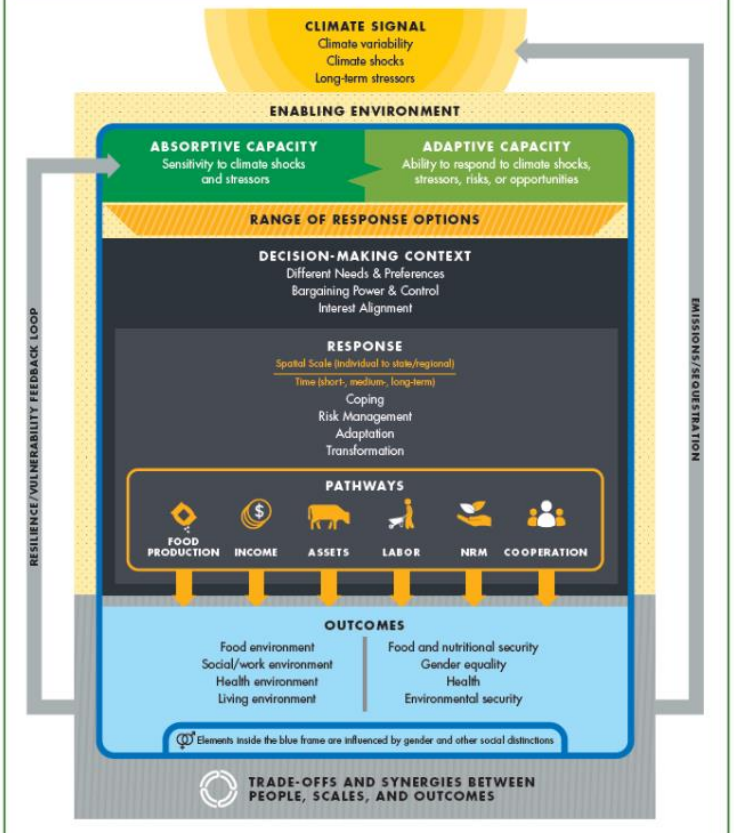
The purpose of this framework is to describe links of gender and nutrition have on resilience but also to identify research and evidence gaps and highlight entry points for program and project design. In this framework are identified 7 dimensions to consider; climate signal, enabling environment, capacities to respond to climate signal, decision-making context, response to climate signal, pathways and outcomes.

Climate signal refers to climate variability, extremes and change. It can vary in intensity, scale, frequency. Policies and laws are part of the enabling environment that can enhance individual, household and group to respond to the climate signal. Bryan et al. (2017b) distinguish absorptive from adaptive capacity, both type of responses are influences by structure of the economy, natural resource base, level of poverty, policy makers' perception, investment in science and technology…
Capacity and gender determine the range of response options available for the decision maker (from individual from the State). Thus responses to climate signal will vary depending on the actors (coping response, risk

management strategy, adaptation, transformative responses). Responses can affect six **pathways**: (1) food production, (2) income, (3) asset dynamics, (4) labor, (5) natural resources, and (6) cooperation. And finally, responses and pathways lead to distinct **outcomes** depending on the food environment (availability, access to food, utilization and the stability of the food supply over time), the social/work environment (shifts in livelihood roles and responsibilities of men, women, and children), the health environment (health stresses and healthcare practices and infrastructure), and the living environment (changes in the availability and quality of natural resources and physical infrastructure, such as health centers, schools, shelters from disasters, and sanitation systems).

Synergies and tradeoffs can occur among environments, development outcomes, timeframes and groups of people. For instance, improve food availability and access through the use of more chemical fertilizers or pesticides may have negative impact on environmental outcomes (Bryan et al., 2017b).

FIGURE 9.1—INTEGRATED FRAMEWORK FOR CLIMATE RESILIENCE, GENDER, AND NUTRITION, GENERAL



Example of conceptualized link between climate resilience, gender and nutrition (Beuchelt and Badstue, 2013).

Looking for tradeoffs is also encourage in Beuchelt and Badstue (2013) conceptualization on gender sensitive nutrition and climate-smart interventions.

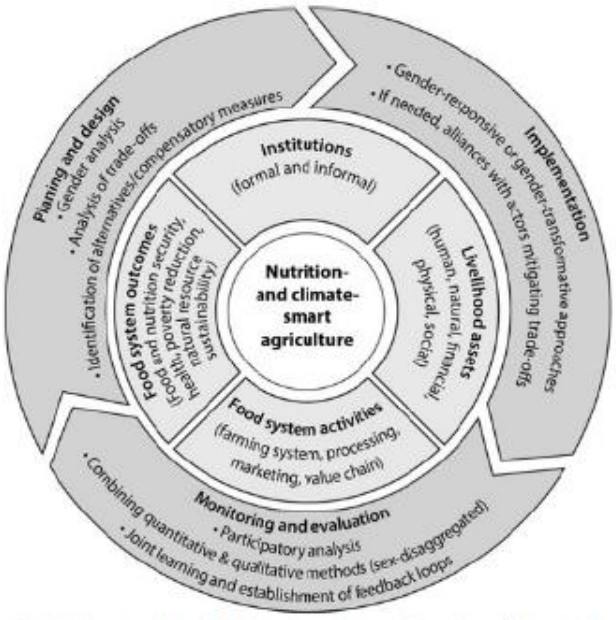


Fig. 2 Conceptual model for enhancing gender and social equity in nutrition- and climate-smart agriculture

Thus nutrition and CSA constitute the overall objective and is located in the centre. Around this objective are located four elements which are livelihood assets (human, social, physical and financial capital needed for agricultural production, processing and marketing), formal (laws and policies) and informal (values, social relations and norms) institutions, food system activities (in all the value chain), and food system outcomes (food and nutrition security, health, poverty reduction and natural resource sustainability). They represent the impact pathway levels, specific to context and intervention.

To achieve nutrition and CSA, gender and equity considerations are needed at all stages for all kind of project cycle (research, policy design and implementation, development project). The third cycle refers to project cycle components (i) planning and design, (ii) implementation, and (iii) monitoring and evaluation (Beuchelt and Badstue, 2013).

Method

Bryan et al. (2017a) recognize that few resilience frameworks incorporate aspects of gender preferences and decision-making processes although these elements are key to consider. Indeed, solutions to address food security and nutrition threatened by CC, overexploitation of natural resources and gender inequalities are often technological ones and do not take into account gender and social inequalities (Beuchelt and Badstue, 2013).

5. Identified bottlenecks

In the literature are identified bottlenecks for gender sensitive policies and programs on CC and food security in the agriculture sector (Table 2).

Table 2: Bottlenecks identified in the literature according to project cycle phase

Policy process	Bottlenecks identified in the literature
Design	• Gender considerations are more included in food and nutrition security sector, than in CC planning in LAC region (Gumucio and Rueda, 2015). • Gender is not integrated in CC planning in Sub-Saharan African countries although it is a key factor to understand adaptive capacity (Bryan et al., 2016) • Budgeting for gender is not completely accepted by governments in Tanzania and Uganda (Ampaire et al., 2017b). • Lack of human capacity in gender issue and budget planning; lack of resources allocated for gender issue (Ampaire et al., 2017b; Bryan et al., 2016; IICA, 2015; Njuki et al., 2016). • Presence of "gender blind" sectorial policies (Ampaire et al., 2017b). • During the policy design, there is a lack of local communities' involvement and no communication with sub-national government, in Uganda (Ampaire et al., 2017; James). • There is a lack of gender sensitization at governmental level in ALC (IICA, 2015).
Implementation	• Although gender is explicitly mentioned in policies at international and national level, there is no more gender-sensitive programs on the ground in sub-Saharan countries (Bryan et al., 2016). • The disappointing results of the gender mainstreaming is linked with the gap between policy design and implementation, lack of institutional commitment and leadership and resistance in East Africa (Ampaire et al., 2017b). • If there are gender considerations identified and formulated at design stage, they are not taken into account at the implementation stage [sub-Saharan Africa] (Bryan et al., 2016) • Gender budget allocated for local level are low and do not correspond to estimated budget in Tanzania and Uganda (Ampaire et al., 2017b). • Gender programs do not address any structural inequalities [Tanzania and Uganda] (Ampaire et al., 2017b). • Mismatch between gender mainstreaming conceptualization in international arenas and cultural and social context at the local level which lead to diverse interpretations [Uganda](Acosta et al., 2019) • There is limited capacity, political interference (due to ineffective decentralization), and functional implementation structures at local level [Africa] (Ampaire et al., 2017; Bryan et al., 2016). • Lack of law enforcement at local level leading to constrained access to resources [Uganda] (Ampaire et al., 2017) • Lack of law enforcement to apply gender sensitive policies (IICA, 2015). • Incorporating gender consideration into activities is seen as adding more work and resources (Bryan et al., 2018)
M&E	• Lack of interest from governments to collect gender disagreed data (Bryan et al., 2016) • Lack of skills in M&E and M&E of budgets (Ampaire et al., 2017b). • Lack of understanding and thus demand from government demand to collect sex-disaggregated data and gender-sensitive programmes (Bryan et al., 2018) • Lack of measure of gender gaps (and their underlying factors) in health, control of assets, and decision-making first to inform project design and impact household productivity, food security, and health outcomes (Njuki et al., 2016). • Inadequate gender disagreed data (Ampaire et al., 2017b; Bryan et al., 2016; Gutierrez-Montes et al., 2018; IICA, 2015): • Most of the time M&E only track men's and women's participation in activities (Bryan et al., 2016); - Most of gender indicators don't allow to assess dynamics/gender relations within households and organizations and fail to assess change over time (Gutierrez-Montes et al., 2018); - Indicators such as "% of households in which adults and youth (males and females) participate in decision-making related to household, farm, and home garden activities" are considered biased (Gutierrez-Montes et al., 2018); - Quantitative data is not sufficient to understand gender dynamics and changes. They should be complemented with qualitative data (Gutierrez-Montes et al., 2018); • There is lack of research on gender and the links with CC/ food security … (Bryan et al., 2016; Bryan et al., 2018)

6. Recommendations

In the literature are also made recommendations to improve gender integration in climate change and food and nutrition security policies and programmes.

Promote **alliances between the government and civil society** to provide gender expertise into the policy making process (FAO, 2011; Gumucio and Rueda, 2015). Collaboration is also suggested between international community and national governments to improve gender mainstreaming (Huyer et al., 2015). A proposed strategy is the creation of multi-stakeholder platforms to strengthen vertical and horizontal communication, awareness and common action/messages integrating implementing actors, governments, research institutes, and donors from gender CC, food security and nutrition areas (Ampaire et al., 2017; Bryan et al., 2016; Tarfur et al., 2015). Thus, the use of **participatory mechanisms** is proposed to foster gender inclusion in policymaking (Gumucio and Rueda, 2015), such as the effective operationalization of policies (Dinesh et al., 2018) and the design of new interventions based on previous successful local experiences (Bryan et al., 2016). In these multi-actor mechanisms, local actors and international organizations (such as donors) can pressure national government to improve gender integration in policy planning and implementation (Bryan et al., 2018). For instance, mechanisms such as funding conditions and incentives use by the international community are seen as an effective way to influence governments (Huyer et al., 2015).

Capacity building and **strategic communication** at national and local level on gender is also key to achieve gender mainstreaming (Ampaire et al., 2017; Dinesh et al., 2018).

It is also widely recommended that gender considerations must be included in all **the stages of the project cycle** and since the design one and must include **specific budget** for implementation and M&E (Ampaire et al., 2017b; Gumucio and Rueda, 2015; Huyer et al., 2015; Tarfur et al., 2015).

Policies objectives need to go beyond looking for equal participation of men and women in activities by trying to raise woman voice and credibility in policy processes (Huyer et al., 2015). To do that, existing laws need to be reformed and/or new ones need to be formulated (IICA, 2018; UNDP, 2016). Indeed, the use of **legal instruments** on gender integration can provide guidance and motivation (Ampaire et al., 2017; Gumucio and Rueda, 2015). Laws need to integrate international commitments and relate to topics such as access to joint property titles and equal inheritance rights, women access to technology, information, inputs and discriminatory norms and social practices (IICA, 2018; Tafur et al., 2015). Short-term policy shifts can be combined with broader policy changes to address gender issues (UN Women, 2015). Agricultural, CC and food security and nutrition policies must include gender considerations in addition to specific gender policies (human right approach) (FAO, 2011). Policy reform must be accompanied by long-term interventions in the field such as sensitization campaigns to foster local level ownership and change in norms (IICA, 2018).
More **research on gender and scaling up gender sensitive interventions** is also necessary to inform policy and project design (Huyer et al., 2015). Research is also needed to develop effective mechanisms to engage women in actions that impact positively CC adaptation and food security and nutrition challenges (Bryan et al., 2016; Bryan et al., 2017b). In general, more evidence is needed to inform policy elaboration (Dinesh et al., 2018).

To improve policy implementation at local level, there is a need for **effective decentralization** that give decision making power at the local government and capacity building (Ampaire et al., 2017).

At the **M&E** level, it is necessary to gather and integrate sex-disaggregated data in agriculture and food security in order to measure to what extent an intervention has achieved its objective in terms of improving livelihood and wellbeing in order to enable making adjustment during the implementation phase (Tarfur et al., 2015; UNDP, 2016; WB, 2012). A mix of quantitative and qualitative analysis are necessary in order to understand also power relation between sex's dynamics, local context and pathways toward equity (DANIDA, 2006; Njuki et al., 2016). Besides, a development of a baseline is useful to measure and monitor change, and thus to be able to track progress towards meeting international standards (such as UNFCCC) (Bryan et al., 2018).

4. Analytical framework

The previous section has established the linkages that exist between gender, CC and food security and nutrition in agriculture, highlighting the synergies and trade-offs that exist between them and underlying the importance of taking these four topics together for an improved policymaking exercise. However, no specific method has been found to assess the gender inclusion in CC and food security and nutrition policies and interventions. Furthermore, issues of coherence, coordination and policy integration were also identified as key to address these major development challenges (gender equality, agricultural development and food security and nutrition in CC context) at the country level. In order to assess the level of gender integration into climate, agriculture and, food security and nutrition in national and sub-national policy design, budgeting, implementation and M&E, it is thus pertinent to develop an integrative framework. This framework would prove useful to assess responsiveness to gender resource gaps, identification of policy implementation bottlenecks, research needs and science policy interface, and identify opportunity for further mainstreaming of gender issue.

This analytical framework aims at answering the following research questions:

- What are the current gaps in the integration of gender in agricultural, CC, and FSN policies?
- What are the bottlenecks that limits the integration of gender in agricultural, CC, FSN and agricultural policies design and implementation?
- What are the synergies and trades-offs to integrate gender issues in agricultural, CC and FSN policy design and implementation?

1. Description of the framework

The proposed framework is multilevel and mobilize the concept of policy mix (Flanagan et al., 2011; Rogge and Reichardt, 2016) (Figure 1).

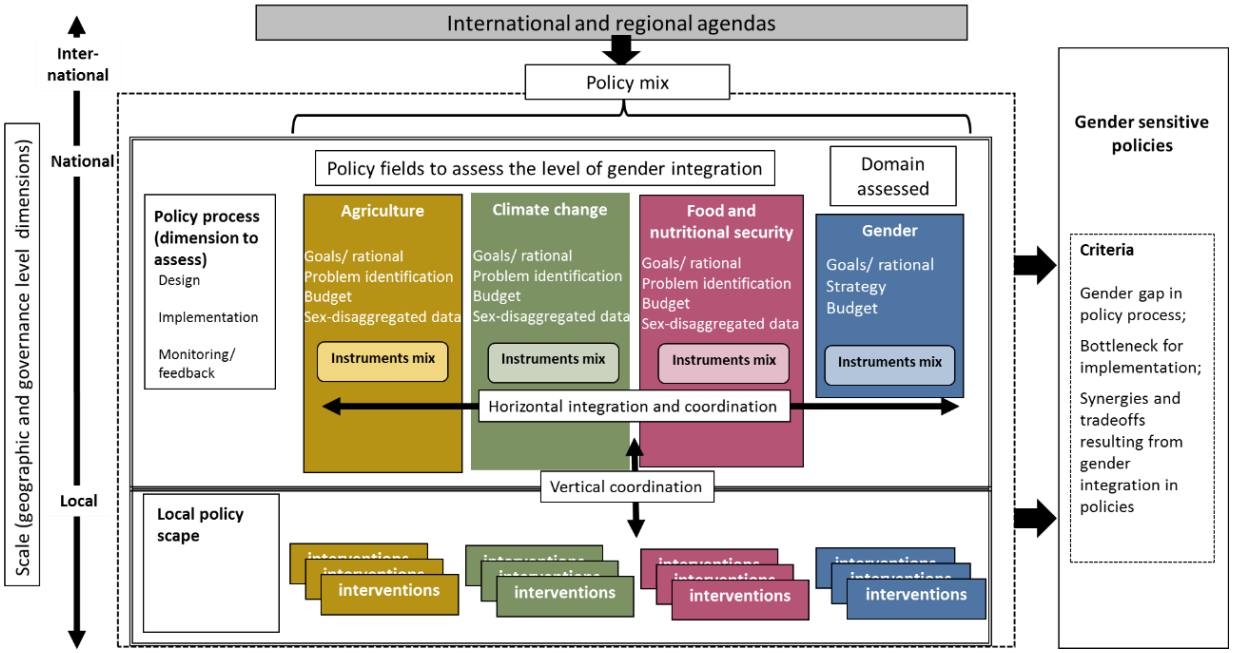


Figure 1: Analytical framework for gender, CC, Food security and nutrition (FSN) policy mix

Scope

This analytical framework is **multilevel** as it not only look at national level but also consider international influence on the national level and also the sub-national level in its implementation of the national policies. However, depending on project resources and time, the scope can be reduced to focus mainly on the national level, or to focus on national and sub-national level.

To select the **sub-national level focus**, several pathways are possible. The local level can be selected based on policies or based on specific problems or strategic importance of some local area. For the policy entry point, the choice can be based on national stakeholder interest (captured during key informant interviews, for instance) or on key national programme intervention area (if the implementation is regional and not national). For the entry point by the local problematic, the identification of local level can be identified through actors' consultations or based on previous findings (participatory scenario focus on dry corridor for FP1).

Conceptual background

The concept of 'policy mix', is useful to understand the complexity interaction of public policy instruments, mostly in a context where different policy instruments are coexisting from distinct domains (food security, agriculture, CC, gender), involves actors from different sectors and aiming different goals (Flanagan et al., 2011). Policy mix is understood as the interactions between policy instruments relevant for one objective in a specific space and time, (Flanagan et al., 2011), in our case addressing issues related to gender, CC and food security and nutrition in the agricultural sector. The interactions and trade-offs (complementarities and conflicts) between policy instruments are then assessed to understand their effects on the ground. It is thus key to associate the concept of policy mix with the one of policyscape referring to the mix of instruments in a particular space (policy space, government space, geographical space, time) (Flanagan et al., 2011; Milhorance and Bursztyn, 2018). Thus it is necessary to define a scope (in our case gender, CC and food security and nutrition in the agricultural sector) and a geographic one

where several identified policy instruments related to the thematic scope are implemented (Central America- Honduras and Guatemala) in order to analyze the policy mix effect in relation with the problems. It is also interesting to see how policy instruments are interacting across levels (from the international understanding to the local level), how they are traduced into programmes, how the specificity of a local context affect (positively or negatively) the programme implementation (Flanagan et al., 2011; Milhorance and Bursztyn, 2018).

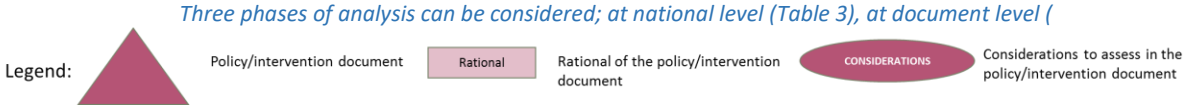
Other concept exist to analysis policy instruments such as policy integration, policy coherence, multilevel governance, policy nexus or policy coordination. However, Milhorance and Bursztyn (2018) conclude that despite having distinct thematic origins, many of those concepts converge in the attempt to characterize the interactions between policy instruments, highlight fragmentation in the public actions in relation with the incorporation of environmental and climatic issues. Policy mix is one the most common concept and is used to argue for the need for integration although it constitute an objective difficult to achieve in practice (Milhorance and Bursztyn, 2018). Finally, independently of the concept used, analytical categories need to be defined so as the factors that influence the interaction between instruments, in a negative and positive way (Milhorance and Bursztyn, 2018). Milhorance and Bursztyn (2018) propose analytical categories: direction of interactions (policy integration): horizontal integration (between sectors) or vertical integration (between levels), external coherence (between sectors- policy nexus) or internal (one sector), and types of interaction (policy mix): between instruments, between objectives, among beneficiaries, and between dimension.

The categories on direction of interactions proposed in the policy integration literature are indeed useful for the identification and presentation of the instruments studied. Policy mix literature proposed types of interaction dimensions (Flanagan et al., 2011; Milhorance and Bursztyn, 2018). Regarding problematic of gender integration in CC food system in agricultural sector policies, it can be assessed at two level: the inclusion of gender considerations at different stages of the policy process and the "intersectionality and the structurally transformative focus of policies" (Krizsan and Lombardo, 2013).

2. Operationalization of analytical framework

The operationalization of this analytical framework include of three components or phases (national, document and actor levels) that require specific data collected through different methods (document review, actors' interviews); and at different levels and scale (from national to sub-national) (see details in Annex 1). The analysis of policy documents is helpful to understand how the gender is integrated in the policy narratives, while the actors' analysis provide information on how the policy is effectively implemented and the challenges and opportunities faced. The local level analysis allows examining how the national policy and policy instruments are affecting processes on the ground, and their contribution to final expected outcomes.

Three phases of analysis can be considered; at national level (Table 3), at document level (



) and at actor level (Table 4).

The first phase of analysis consists in **an inventory and overview of policy documents** (law, framework, strategy, plan,…) relative to each policy fields considered. This overview aims at mapping the existing policy at national level. It also enable to specific information regarding the integration of gender in the

policy mix and context (Table 3). As international dimension is important in the mainstreaming of issues of Gender integration (Kennett and Lendvai, 2014), countries international commitments are listed. Where available, budget information relative to each policy field or sectors is gathered to have a first overview on the interest and priority given to them.

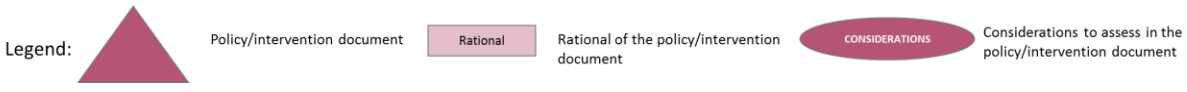
Additionally, the current state institutional structure (policy organization) is capture though organigrams, which is an indicator of the institutional form of integrations of thematic (True and Mintrom, 2001). It informs on the way gender has been integrated in institution (through specific office, in the different sectors). Key public institutions are identify for each sectors, as well as the institutional platform / arenas of coordination among those. From this level of analysis, actors' involved in the different sectors are identified (actors' mapping).

Table 3: Data to collect at the national level for gender, Climate Change (CC) and Food security and nutrition (FSN) in agricultural sectors

	Gender	Agriculture	CC	FSN
Number and nature of international commitments adopted by the country				
Type of institutional layout regarding established by countries for gender mainstreaming				
Amount of international aid flows				
National budget dedicated to gender (distinguish predicted from allocated)				
Number and nature of policy document(law, policy, strategy) at national and sub-national level				

The second phase consists **in depth analysis of selected policy documents** which objective is twofold: characterize the objectives, rational, approach of each policies, and identify existing instruments (type of instruments, specific objectives) and how they integrate the gender dimension.

In



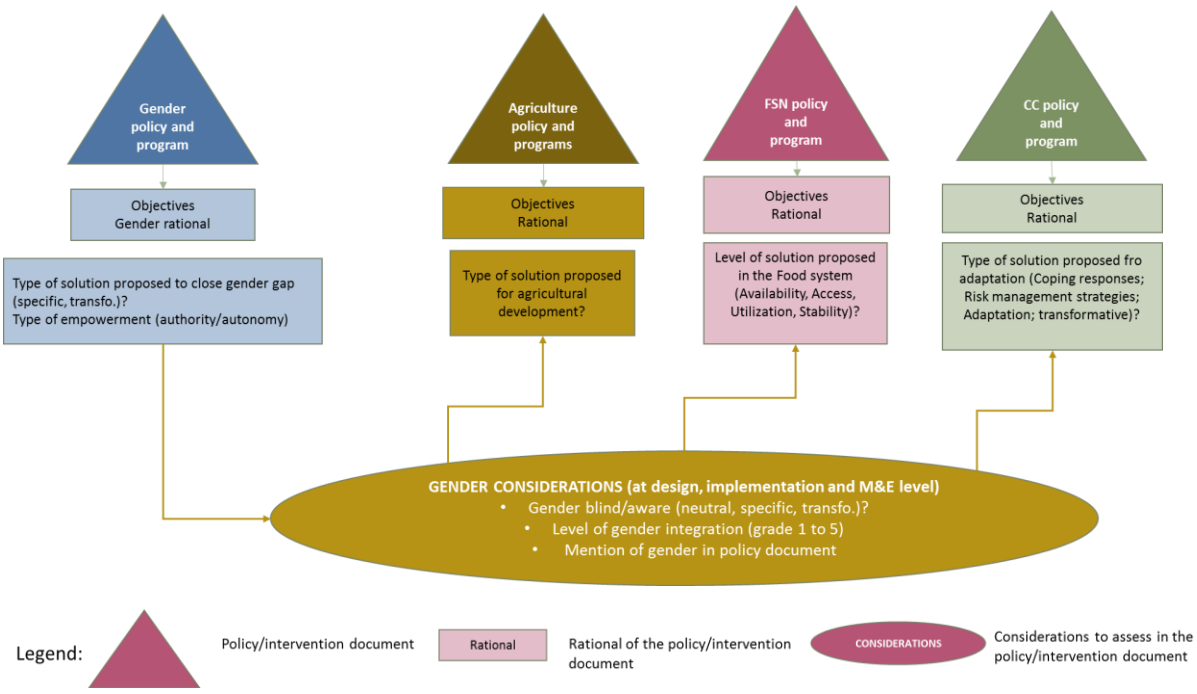
is presented the specific analytical framework for the analysis at the document level. The triangles represent each policy domains (agriculture, FSN, CC and gender). For instance, the green triangle on the right side of the figure refers to CC policies. The first step consist in characterizing the rational chosen for the policy/intervention (represented in the boxes) for each policy field / sectors / topic. For instance, the

policy on CC is promoting solutions for coping strategy or risk management? Does the approach for gender policy/intervention can be described as specific or transformative?

Once characterized the rational of policies, a second step is to assess the level of inclusion of gender issue in each documents.

For this document analysis, several tools can be used such as GEPHI, a Social Network Analysis (SNA) software to map relationships between policy documents, their coherence in term of objectives, their relative weight (in term of budget) etc. (Jacomy et al., 2014). Another tool that can be used is qualitative data analysis software such as Atlas.ti. The software is indeed useful to understand how gender are traduced at different level (from international to national level, from national to sub-national level) through document analysis and/or discourse analysis (Acosta et al., 2018). This tool can also be useful to understand how discourses and instruments are presenting gender issues and how they are proposed to be addressed through what kind of solutions and budget (Acosta et al., 2018).

Figure 2: Analytical framework for gender integration in agriculture, CC, Food security and nutrition (FSN) in policy documents



The third phase consists in **actors' analysis**, which is based on information collected through actors interviews involved in policy process of agriculture - CC – FSN policy mix, at national and local level.

This interviews aims at gathering information regarding actors' objectives (rational), the way they frame the problem and its interrelationships with other issues (framing), its value/preference/knowledge/belief system, its perception on the main instruments (degree and bottleneck of implementation)..

In the Table 4, specific variables and questions are proposed for each stage of policy process, and program/projects cycle (design, budget, implementation and M&E) in order to specifically assess: the level of gender inclusion in agriculture, CC and FSN policies and interventions. The level of gender consideration

(gender blind/ aware; level of gender integration, mention of gender policy) will allow to attribute a rating to a policy in term of gender integration from low to high for each stage of policy process (design, budget, implementation and M&E) and a general rating for the policy. For instance, the level of gender integration in a policy could be presented as in Figure 3 is showing a policy that has a high level of gender integration at design level (3), low gender consideration in budget (1), a medium inclusion of gender in the implementation (2) but no inclusion of gender for M&E (0).

Figure 3: Example of rating attributed to a policy in term of gender integration

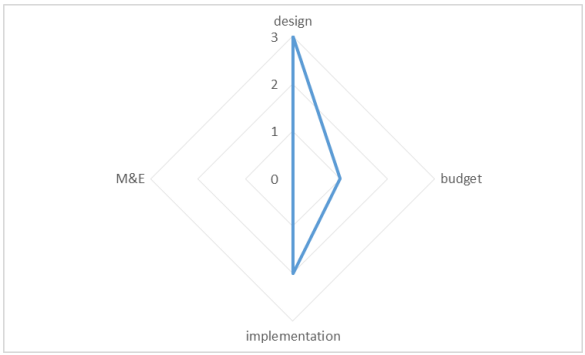


Table 4: Variables and respective questions to assess gender inclusion in agricultural, CC and FSN policies and interventions

Variables to assess	Questions
Level of gender integration at design stage	**Problem identification** • Is there an existing gender analysis of the sector (agriculture/CC/FSN) in which the intervention will occur? Have gender studies been done on the sector or community in which the project will be implemented? • Where do the greatest gender inequalities lie in the affected region? • What are the differences in gender roles in the sector within the region, and country? • Are gender data available that could inform the project? **Barrier for women participation** • Could existing barriers for women or women-headed households limit their participation in the project? • Is the project targeting a minimum number of women leaders to lessen the existing gender gap? **Design process** • How is addressed the differential capacity of women to participate in policy design? Which procedure has been put in practice to ensure gender participation? • Do women face particular constraints in accessing inputs, credit, and use of land? **Project/policy contents** • Does the central and local government have institutional mechanisms to complement the gender equality goals of the project? (linkages) **Overall problem** • What are the main bottleneck that limit the inclusion of gender considerations in agriculture/FSN/CC at the planning and design level?

Gender budget (planned and effective)	• Does the project allocate specific resources to mainstream gender or to focus gender population? • What is the planned and effective budget for gender component? • What are the main bottleneck that limit the inclusion of gender considerations in FSN/CC at the budgeting level?
Level of gender integration at implementation stage	**Gender leadership** • How are women represented on the project team and in the area of intervention? Do women occupy leadership positions? • Will a gender specialist be recruited to mainstream gender in the project's various components? **Gender specific activities** • Does the implementation agency plan include a gender component? • Who are the actors implementing at local level (arena)? • What are the main bottleneck that limit the inclusion of gender considerations in FSN/CC at implementation level?
Level of gender integration at M&E stage	• Does the M&E gender sensitive? How ? • Are sex-disaggregated data being collected during the phases of the project? • Is the intervention able to measure impact on gender equality? • Will the data to be collected contribute to a better understanding of gender specificities in the sector and the country? • Does the survey design make it possible to capture data that will measure the project's contributions to the sector under analysis? • What are the main bottleneck that limit the inclusion of gender considerations in FSN/CC at the M&E level?

The data analysis of data collected though actors' interviews will mobilize tools such as analytical methods to grasp cognitive aspects such as discourse analysis (Acosta et al., 2018).

The application of the three phases (inventory and overview of policy documents, in depth document analyses and actors' level analysis at national and local scale) aims at understand: how the situation of women/men/girls/boys in the agricultural/ food security and nutrition sectors/CC policy fields are conceived and analyzed? And to what extent do the policies address the gender situation in these sectors, and what is the budget allocated and spent? (Ampaire et al., 2017b).

The analytical framework and its operationalization proposed here, should be, nevertheless, adjusted according to the lessons learned through its testing in Honduras and Guatemala. The framework is for now integrating all the criteria found in the literature, but should be adjusted according to the FP1 specific factors (time, resources, access to information, etc). Thus, the next step is to use and test this framework in order to assess its operability.

4. Conclusion

This report pointed out the links between gender and CC, FSN in agriculture and proposed an analytical framework in order to assess gender integration in policies. Agriculture is made up of men and women whose needs and challenges need to be taken into account in order to achieve productivity improvement. Besides, women, generally in charge of food security in their households and within all the food system chain but at the same time victim of food insecurity and malnourishment. In this way including gender considerations in policy and practice will prove key to achieve food security and nutrition objectives at national level. In a context of CC, women being generally part of the most vulnerable groups, integrating their specific needs, access to resources, adaptive capacity in the policy design and implementation is crucial in order to support them adequately. These links are particularly relevant in the LAC region, where are faced complex and specific issues related to CC, gender and food security and nutrition (men migration, women discrimination, food insecurity and obesity…).

Once recognized the relevance of thinking and addressing these issues in an integrated way at the national level, it is important to understand how the national level interact with the international one. For instance, countries make commitments around gender, food security and nutrition and CC that should be translated into impact on the ground. Literature shows that the effect in the countries are disappointing and invite to look at how national and sub-national policy makers are appropriating international concepts and translating them into policy document and programmes. A policy mix approach is, besides, useful to circumscribe policy documents and actors that should be include in the assessment, and help to identify conflicts and synergies between policy instruments and then draw lessons for policy makers to improve their intervention efficency.

Thus this analytical framework is aiming at providing a tool that can integrate multiple level and multiple domains issues in order to better understand how these issues are linked and addressed in a country and to give insight on how to improve articulation in order to achieve national and international objectives.

Through a literature review on gender, CC, food security and nutrition, criteria have been identified that helped to design an analytical framework. It is useful to collect information need to define the policy scope and to assess it. This constitutes the next step of this study, to test this analytical framework in two countries, Honduras and Guatemala.

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